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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,874	08/10/2006	Thomas Blaffert	PHDE040045US	7335

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EXAMINER	
PATEL, NIRAV G	

ART UNIT	PAPER NUMBER
2624	

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03/12/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,874	BLAFFERT ET AL.	
	Examiner	Art Unit	
	Nirav G. Patel	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

It would be of great assistance to the Office if all incoming papers pertaining to a filed application carried the following items:

1. Application number (checked for accuracy, including series code and serial no.).
2. Group art unit number (copied from most recent Office communication).
3. Filing date.
4. Name of the examiner who prepared the most recent Office action.
5. Title of invention.
6. Confirmation number (See MPEP § 503).

Response to Arguments

1. Applicant's arguments, see Pages 5-6, filed 12/17/2009, with respect to the rejection(s) of claim(s) 1 and 9 under 35 U.S.C. § 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ko.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 9 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ko et al. ("Chest CT: Automated Nodule Detection and Assessment of Change over Time-Preliminary Experience," "Ko").

1) Regarding Claim 1, Ko teaches a data processing unit for registering a first image and a second image of an object, the data processing unit being set up to: segment the images automatically into various object constituents (Page 269, Cols 1, 2, & 3, Sections titled "Thorax and lung border detection," "Lung border correction and parenchymal detection": The system automatically determines the locations of the lungs and thorax and then continues to find their boundaries from the volume of the acquired data, and isolating them, seen in Figure 2, thus segmenting the image into various object constituents);

register only those image areas associated with object constituents which are relevant to a predetermined task, wherein the object constituents to be registered are selected independently from the first image and the second image (Page 270, Col. 1, Section titled "Analysis of consecutive CT sections with three-dimensional techniques": The images that depicted the trachea (constituent relevant to the task), the centroids were calculated and registered from images, which is independently, as the trachea is selected in each image, and then registered).

2) Regarding Claim 9, Ko teaches a method for registering a first image and a second image of an object, comprising the following steps: automatic segmentation of the images into various object constituents (Paragraph 26: to get the area and boundary information, the two lungs are segmented from the image sets for each slice, mainly by techniques related to thresholds. Objects that are not encompassed in the threshold limits set by the GUI (Paragraph 23) can be automatically segmented to other constituents);

registration of the image areas associated with object constituents relevant to a predetermined task, wherein the object constituents to be registered are selected independently from the first image and the second image (Paragraph 30: A user selects a nodule seen in the first image set and the system then finds the object of interest in a second image area which is the most similar to the object in the first image. The system allows for an individual to select an object constituent by using a GUI and then registers VOI's which are associated with the preselected object constituent (nodule in image A), which is relevant to the predetermined task of locating lung nodules in images. The constituents to be registered are selected independently (by a user who selects a nodule in the first image set, the set containing at least a first and second image, which is independent from the second image)).

3) Regarding Claim 18, Ko teaches a method for a user to use a data processing unit to register a first image and a second image of an object, the method comprising:

the user selecting one or more object constituents to be registered without consideration of the first image or the second image, the selected object constituents being relevant to a predetermined task, and the user inputting the selection into the data processing unit (Page 270, Col. 2, Lines 14-16: The computer vision system (data processing unit) needed to have lung apices identified manually (thereby determining the location of the lungs and thorax, and finding their boundaries, Shown in Figure 2), and not considering the other images (independently, when the user is labeling the apices, he/she is not considering another image). The apices are the constituents relevant to the predetermined task (apices found within the CT section), all which is inputted into the computer vision system);

the data processing unit being set up to automatically segment the first image and the second image into one or more object constituents, and then to register only the

selected object constituents (Page 269, Cols 1, 2, & 3, Sections titled "Thorax and lung border detection," "Lung border correction and parenchymal detection": The system automatically determines the locations of the lungs and thorax and then continues to find their boundaries from the volume of the acquired data, and isolating them, seen in Figure 2, thus segmenting the image into various object constituents. Page 270, Col. 1, Section titled "Analysis of consecutive CT sections with three-dimensional techniques": The images that depicted the trachea within the lung region section (constituent relevant to the task), the centroids were calculated and registered from images, which is independently, as the trachea is selected in each image, and then registered).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ko in view of Sofia Totterman et al. (U.S. Pub. No.: 2003/0072479, "Sofia Totterman").

1) Regarding Claim 2, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 2.

However, in the same field of endeavor, Sofia Totterman teaches a data processing unit for registering a first image and a second image of an object, in particular a data processing unit which is set up to: segment the images automatically into various object constituents (Paragraph 67: The connectivity among the voxels is estimated by a comparison of the mean values and variances estimated to form regions (object constituents). Once the

connectivity is estimated, it is determined which regions need to be split, and those regions are split (automatically).);

register the image areas of various object constituents using individually assigned registration methods (Paragraph 69: the approach of the present invention takes into account the local deformations of soft tissues by using a priori knowledge (registration method) of the material properties of the different structures found in the image segmentation. Also, different strategies (registration methods) can be applied to the motion of the rigid structures and to that of the soft tissues to register the image areas).

Incorporating the teachings of Sofia Totterman allows for segmenting images automatically using individually assigned registration methods. Segmenting images automatically, using individually assigned registration methods allows for the images to be grouped off so that another process or user may discard the groups which are considered irrelevant to the examination of the images or noise.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Sofia Totterman to Ko.

2) Regarding Claim 10, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 10.

However, in the same field of endeavor, Sofia Totterman teaches the registration is performed using individually assigned registration methods in each object constituent (Paragraph 69: the approach of the present invention takes into account the local deformations of soft tissues by using a priori knowledge (registration method) of the material properties of the different structures found in the image segmentation. Also, different strategies (registration methods) can be applied to the motion of the rigid structures and to that of the soft tissues to register the image areas).

Incorporating the teachings of Sofia Totterman allows for segmenting images automatically using individually assigned registration methods. Segmenting images automatically, using individually assigned registration methods allows for the images to be grouped off so that another process or user may discard the groups which are considered irrelevant to the examination of the images or noise.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Sofia Totterman to Ko.

6. Claims 3, 5, 6, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ko in view of Zhao et al. ("Directional Edge Registration for Temporal Chest Image Subtraction," "Zhao").

1) Regarding Claim 3, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 3.

However, in the same field of endeavor, Zhao teaches segmented object constituents are automatically classified (Part II, Section C: "Ribs extraction and Boundary detection," Lines 1 - 3: a set of rule base (reasoning) algorithms to identify rib edges was developed. The lung and heart boundaries were extracted using an invert umbrella filter. Both methods are automatic to classify objects and extract them).

Incorporating the teachings of Zhao allows for automatically classifying of segmented images. Automatically classifying the segmented images provides an efficient way to take segmented images and determine if they contain wanted data or unwanted data. This would allow for a conclusion to be made of the data which has been segmented.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Zhao to Ko.

2) Regarding Claim 5, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 5.

However, in the same field of endeavor, Zhao teaches a first image and/or the second image are/is (a) two- or three-dimensional computer tomogram(s), in particular an X-ray photograph or a magnetic resonance image (Abstract: Temporal chest radiographs (2D X-ray) were used in a directional filtering technique).

Incorporating the teachings of Zhao allows for acquiring images. Acquiring 2D or 3D x-rays or magnetic resonance images (MRI) is a way to acquire images of a patient's internal organs which is not invasive.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Zhao to Ko.

3) Regarding Claim 6, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 6.

However, in the same field of endeavor, Zhao teaches an object is the chest of a patient, the lungs being the object constituent relevant to a tumor diagnosis (Abstract: Normal chest structures (ribs, hear, and other normal lung structures) were reduced due to this technique, therefore the regions of the lung were tumors are present were not reduced).

Incorporating the teachings of Zhao allows for imaging the chest of a patient. Imaging the chest allows for the lungs of a patient to be imaged so that a diagnosis can be made concerning the presence of tumors.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Zhao to Ko.

4) Regarding Claim 11, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 11.

However, in the same field of endeavor, Zhao teaches segmented object constituents are automatically classified (Part II, Section C: "Ribs extraction and Boundary detection," Lines 1 - 3: a set of rule base (reasoning) algorithms to identify rib edges was developed. The lung and heart boundaries were extracted using an invert umbrella filter. Both methods are automatic to classify objects and extract them).

Incorporating the teachings of Zhao allows for automatically classifying of segmented images. Automatically classifying the segmented images provides an efficient way to take segmented images and determine if they contain wanted data or unwanted data. This would allow for a conclusion to be made of the data which has been segmented.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Zhao to Ko.

5) Regarding Claim 13, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 13.

However, in the same field of endeavor, Zhao teaches one of the first image and the second image is a two- or three-dimensional computer tomogram (Abstract: Temporal chest radiographs (2D X-ray) were used in a directional filtering technique).

Incorporating the teachings of Zhao allows for acquiring images. Acquiring 2D or 3D x-rays or magnetic resonance images (MRI) is a way to acquire images of a patient's internal organs which is not invasive.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Zhao to Ko.

6) Regarding Claim 14, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 14.

However, in the same field of endeavor, Zhao teaches an object is the chest of a patient, and the predetermined task is tumor diagnosis in a lung of the patient (Abstract: Normal chest structures (ribs, hear, and other normal lung structures) were reduced due to this technique, therefore the regions of the lung were tumors are present were not reduced).

Incorporating the teachings of Zhao allows for imaging the chest of a patient. Imaging the chest allows for the lungs of a patient to be imaged so that a diagnosis can be made concerning the presence of tumors.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Zhao to Ko.

7. Claims 4, 12, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ko in view of Kawata et al. ("Tracking interval changes of pulmonary nodules using a sequence of three-dimensional thoracic images," "Kawata").

1) Regarding Claim 4, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 4.

However, in the same field of endeavor, Kawata teaches a linear registration is performed on several resolution levels (Abstract Lines 1 – 2: a computerized approach to characterize pulmonary nodules through quantitative analysis between sequential 3-D thoracic images is developed), rigid bodies being registered on a coarse grid (Abstract Lines 2 – 3: the registration procedure of sequential 3-D pulmonary images consisted of two transformation steps: the rigid transformation step between two sequential 3-D thoracic CT image, which is on a coarse grid as the next step involves a finer grid) followed by affine registration on a finer grid (Abstract Lines 2 – 4: the registration procedure of sequential 3-D pulmonary images consisted of two transformation steps: the affine transformation step between two sequential region-of-interest (ROI) images including the pulmonary nodule, this is on a finer grid).

Incorporating the teachings of Kawata allows for linear registration on several resolutions to be performed. Registering rigid bodies on a coarse grid allows for objects not of interest, such as ribs, arteries, veins and other irrelevant imaged bodies to be identified without the need to finely define their boundaries due to the fact that they are not of concern. Performing an affine registration on a finer grid allows for regions of interest to be registered with high level of accuracy so that a proper diagnosis can be made.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kawata to Ko.

2) Regarding Claim 12, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 12.

However, in the same field of endeavor, Kawata teaches a linear registration is performed on several resolution levels (Abstract Lines 1 – 2: a computerized approach to

characterize pulmonary nodules through quantitative analysis between sequential 3-D thoracic images is developed), rigid bodies being registered on a coarse grid (Abstract Lines 2 – 3: the registration procedure of sequential 3-D pulmonary images consisted of two transformation steps: the rigid transformation step between two sequential 3-D thoracic CT image, which is on a coarse grid as the next step involves a finer grid) followed by affine registration on a finer grid (Abstract Lines 2 – 4: the registration procedure of sequential 3-D pulmonary images consisted of two transformation steps: the affine transformation step between two sequential region-of-interest (ROI) images including the pulmonary nodule, this is on a finer grid).

Incorporating the teachings of Kawata allows for linear registration on several resolutions to be performed. Registering rigid bodies on a coarse grid allows for objects not of interest, such as ribs, arteries, veins and other irrelevant imaged bodies to be identified without the need to finely define their boundaries due to the fact that they are not of concern. Performing an affine registration on a finer grid allows for regions of interest to be registered with high level of accuracy so that a proper diagnosis can be made.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kawata to Ko.

3) Regarding Claim 16, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 16.

However, in the same field of endeavor, Kawata teaches the registration is one of a rigid body transformation, an affine transformation, and a non-linear spline function (Abstract Lines 1-3: A computerized approach to characterize pulmonary nodules through quantitative analysis between sequential 3-D thoracic images is developed. The registration procedure of sequential

3-D pulmonary images consisted of two transformation steps: the rigid transformation step between two sequential 3-D thoracic CT images, which are on a coarse grid as the next step involves a finer grid).

Incorporating the teachings of Kawata allows for linear registration on several resolutions to be performed. Registering rigid bodies on a coarse grid allows for objects not of interest, such as ribs, arteries, veins and other irrelevant imaged bodies to be identified without the need to finely define their boundaries due to the fact that they are not of concern. Performing an affine registration on a finer grid allows for regions of interest to be registered with high level of accuracy so that a proper diagnosis can be made.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kawata to Ko.

4) Regarding Claim 17, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 17.

However, in the same field of endeavor, Kawata teaches the registration is one of a rigid body transformation, an affine transformation, and a non-linear spline function (Abstract Lines 1-3: A computerized approach to characterize pulmonary nodules through quantitative analysis between sequential 3-D thoracic images is developed. The registration procedure of sequential 3-D pulmonary images consisted of two transformation steps: the rigid transformation step between two sequential 3-D thoracic CT images, which are on a coarse grid as the next step involves a finer grid).

Incorporating the teachings of Kawata allows for linear registration on several resolutions to be performed. Registering rigid bodies on a coarse grid allows for objects not of interest, such as ribs, arteries, veins and other irrelevant imaged bodies to be identified without the need to finely define their boundaries due to the fact that they are

not of concern. Performing an affine registration on a finer grid allows for regions of interest to be registered with high level of accuracy so that a proper diagnosis can be made.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kawata to Ko.

8. Claims 7, 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ko in view of Kuhnigk (U.S. Pub. No.: 2005/0196024).

1) Regarding Claim 7, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 7.

However, in the same field of endeavor, Kuhnigk teaches segmentation is performed using a watershed transformation (Paragraph 29: segmentation is performed by means of a watershed transformation).

Incorporating the teachings of Kuhnigk allows for segmenting images. Performing a segmentation using a watershed transformation allows for segmentation based on topology, so that areas of interest are segmented properly and do not loose relevant information.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kuhnigk to Ko.

2) Regarding Claim 8, while Ko teaches the limitations of claim 1, he fails to teach the limitations of claim 8.

However, in the same field of endeavor, Kuhnigk teaches an imaging device for producing images of an object (Paragraph 40: three dimensional lung image data is acquired by computer tomography, nuclear magnetic resonance tomography or by means of another image modality);

a data processing unit as claimed in claim 1, coupled to the imaging device (Figure 2: Computer system 200 (data processing unit) is coupled to the image data acquisition system 202 (imaging device).

Incorporating the teachings of Kuhnigk allows for an imaging device to produce image of an object. Using an imaging device such as nuclear magnetic resonance or computer tomography allows for an image of chest region of a patient to be produced. Coupling the device to a data processing unit allows for a way to implement Sheen's method in a computer system which will perform the calculations quicker and accurately.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kuhnigk to Ko.

3) Regarding Claim 15, while Ko teaches the limitations of claim 9, he fails to teach the limitations of claim 15.

However, in the same field of endeavor, Kuhnigk teaches segmentation is performed using a watershed transformation (Paragraph 29: segmentation is performed by means of a watershed transformation).

Incorporating the teachings of Kuhnigk allows for segmenting images. Performing a segmentation using a watershed transformation allows for segmentation based on

topology, so that areas of interest are segmented properly and do not loose relevant information.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Kuhnigk to Ko.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ko in view of Bullitt et al. (U.S. Pub. No.: 2007/0019846, "Bullitt").

1) Regarding Claim 19, while Ko teaches the limitations of claim 18, he fails to teach the limitations of claim 19.

A method as claimed in claim 18, wherein the data processing unit is further set up to register the selected object constituents using individually assigned registration methods (Paragraph 91: Various registration techniques are used, including a tissue-based correlation).

Using a tissue-based correlation registration method allows for use tissue structure (vessels in the lung) as a way of accurately registration structures in one image (one study) to another image (second study) such that a precise comparison can be made in Ko's teachings.

Therefore it would have been obvious to one of ordinary skill at the time of the invention to apply the teachings of Bullitt to Ko.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nirav G. Patel whose telephone number is (571)270-5812. The examiner can normally be reached on Monday - Friday 8 am - 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nirav G. Patel/
Examiner, Art Unit 2624

/CHARLES KIM/
Primary Examiner, Art Unit 2624